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How to Get

BETTER COTTON YIELDS

in 1943

BY SEED TREATMENT

IMPERIAL MYCOLOGICAL INSTITUTE 28 JUL

By

K. STARR CHESTER and W. W. RAY

Below: The thick stand of cotton seedlings at the right is from treated seed. An equal number of untreated seeds was planted at the left, but only a few scattered seedlings developed. The soil on both sides is heavily infested with the organism causing a seedling blight common in Oklahoma.

How to Get Better Cotton Yields in 1943 by Seed Treatment

By K. STARR CHESTER and W. WINFIELD RAY
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The 1943 cotton crop must be produced in face of labor and equipment shortages, reduced acreages, and many other handicaps contingent on the war. This means that full use must be made of recognized crop-improving and labor-saving practices. One of the cheapest and most effective means of improving the yield of cotton is chemical treatment of planting seed.*

In 1942, much of the cotton seed planted in Oklahoma was brought in from other states. The bulk of this seed had been treated, and whether or not the grower realized it he was planting treated seed. This seed helped produce the good crop of 1942.

The seed to be planted this season is now stored on the farm, untreated. But the benefits of seed treatment can be obtained if the grower takes the initiative himself and sees that his seed is treated before planting.

Seed Treatment Pays in Oklahoma

Tests at the Oklahoma Agricultural Experiment Station over the past five years, similar tests in other cotton-producing states, and the personal experience of many Oklahoma farmers all testify to the fact that cotton seed treatment pays. In the Oklahoma Experiment Station tests, cotton yields over a five-year period showed an average of 19 percent gain following seed treatment with disinfectant chemicals at a cost of only a few cents per acre. Seed treatment is a form of cheap insurance against replanting poor stands, and this insurance pays dividends often enough to indicate that *every cotton seed planted in Oklahoma should be treated.*

How Seed Treatment Helps

Poor stands, generally blamed on the weather or poor seed, actually are often the result of seed- or soil-borne parasites, molds and bacteria. These plant pests flourish best when the soil is cold and wet and the cotton seedlings are making slow growth. Seed treatment coats the planting seed with a chemical that kills any disease organisms

* NOTE: This circular takes up seed treatment in which *disinfectant chemicals* are applied to cotton seed to kill disease organisms on the seed and in the soil nearby. This has no connection with *"hormone" seed treatments* which have been sometimes reported to increase cotton yields, but which are still in the experimental stage and not in general use.

hidden in the fuzz or on the seedcoat. In addition, it surrounds the planted seed with a vapor that "gasses" and destroys disease parasites lurking in the soil about the seed, ready to attack and destroy the young seedling.

Seed treatment thus contributes to better stands of healthier young plants. This has several advantages:

1. Improved stands make it possible to reduce planting rates. This cuts both the cost of seed and the cost of chopping. With treated seed, the seeding rate may be reduced to 15 pounds per acre or even less in areas where 20 pounds of untreated seed are usually planted, and proportionately in areas where heavier seeding rates are used. The saving in seed through reduced planting rates more than covers the cost of the treatment. In 1943, saving of seed has even greater significance, because this year every ton of seed that can be saved and directed to the oil mills will produce approximately 300 pounds of oil, 900 pounds of protein cake, 200 pounds of linters, and 500 pounds of hulls, all vital to the war effort.

2. Reduced planting rates reduce the cost of chopping to thin overplanted but uneven stands, a factor of great importance in this year of labor shortage. The increased yields from treated seed further economize on labor, since it costs as much to cultivate a poor stand as a good one.

3. Seed treatment also attacks and destroys at their source some parasites which persist through the development of the cotton plant and cause rotten bolls or locks, or stained and weak lint. Among this type of parasite is the germ of angular leaf spot or bacterial blight, Oklahoma's most common and serious cotton disease. The germs of angular leaf spot are carried from one crop to the next mainly in the fuzz on the seed coat. Seed treatment kills these germs and thus prevents or delays the appearance of this disease.

Seed treatment should not be looked upon as a panacea or cure-all for all cotton troubles. It gives no direct protection against such cotton diseases as wilt or Texas root rot, nor against insects. It will give good seed a better chance of producing good plants, but will not bring dead seed to life or compensate for carelessness in caring for seed or for the crop. Under weather or soil conditions that are very unfavorable for cotton, even treated seed will fail; while if the seed, soil, and weather are all very favorable for cotton development no advantage may be seen from treatment. But it is under average growing conditions, with average seed, that cotton seed treatment has proven its worth in Oklahoma as a valuable form of low-cost cotton insurance.

SEED TREATMENT RECOMMENDATIONS FOR 1943

War shortages of chemicals and equipment, and new experimental data, require a few changes in this year's recommendations on cotton seed tratment.

Chemicals Available for Seed Treatment This Year

In the past New Improved Ceresan has been recommended as the most useful cotton seed treatment chemical for Oklahoma. This is a mercury compound, and mercury is needed in military manufacture. The supply of New Improved Ceresan available for seed treatments in Oklahoma in 1943 will probably be nearly equal to that allotted in 1942. However, this chemical is also needed for cereal production, and is probably the only chemical that is suitable and available for seed treatment of oats and barley this year. Fortunately there is a considerable supply of 2% Ceresan available, and so far as possible this should be used on cotton seed to conserve the supply of New Improved Ceresan.

The new seed treatment chemical, Spergon, may be used in place of Ceresan with good results when seed are to be planted in neutral to alkaline soils. It cannot be recommended at present for areas of acid soils, as under this condition it may prove injurious to the seed.

If the chemicals mentioned above cannot be obtained locally, information as to their availability can be secured from the manufacturers: For New Improved Ceresan and 2% Ceresan, Bayer-Semesan Co., Wilmington, Del.; for Spergon, Naugatuck Chemical Division of U. S. Rubber Co., Naugatuck, Conn.

Reduced Dosages for 1943

Experiments in Oklahoma show that the rate of application of disinfestant dusts may be reduced well below the dosages heretofore recommended by the Experiment Station and the manufacturers. Instead of the 1½ oz. of New Improved Ceresan usually applied per bushel of fuzzy seed, the amount may be cut to 1 oz., or even ½ oz. if the dust is well mixed with the seed. Similarly the dosage of 2% Ceresan can be reduced from 3 to 2 oz. or 1½ oz. if applied to reginned seed.* The recommended dosage for Spergon is 3 oz. per bushel of fuzzy seed or 2 oz. per bushel of reginned seed. These reduced dosages will conserve the chemicals and lower the cost of treatment without material loss of the advantages of seed treatment.

With these reduced dosages it is best to store the seed in a fairly airtight container for 24 to 48 hours after treating.

* See page 7 for further information on reginned seed.

Reduced Planting Rate With Treated Seed

When treated cotton seed is used, the planting rate may be reduced as much as one-third without impairing the stand. By taking full advantage of this, the cost of seed and chopping can be lowered and seed conserved for wartime uses. As a general rule, ½ bushel of treated seed will give at least as good a stand as ¾ bushel of untreated seed, provided the smaller amount of seed can be planted at a fairly even rate.

When to Treat

Cotton seed may be effectively treated at any time up to one day before planting. Seed may be planted a year or more after treatment without losing the effect of the treatment and without injury to the seed.

Seed Treaters

Home-made rotary seed treaters are already available on some farms. The best rotary treaters are those made from steel drums of 30 or 50 gallons capacity. Such metal drums are now scarce, and substitutes constructed of wood may be used.

Many gins in Oklahoma are equipped to treat cotton seed, and in many one-variety communities large quantities of seed can be treated economically and speedily. Other gins can do custom treating economically providing the quantity of seed to be treated is fairly large.

Those wishing to treat their own seed at home can do an excellent job with a home-made rotary treater. Gravity treaters, such as the Minnesota treater commonly used for the treatment of cereals, will not satisfactorily distribute the chemical dust on fuzzy cotton seed. Two suitable types of treaters are described:

1. Drum Type.—The cost of a steel drum treater is about $5, if the drum has to be bought. A wooden barrel will serve the purpose providing it is of tight construction and strong enough to handle the weight of seed. The materials required to build a metal drum treater are indicated in Figure 1. Half of one end of the drum is removed and a hinged door put in its place. When the seeds are to be removed following the treating process, the door is turned nearest the ground and the seeds readily fall out into a tub or other container. The mixing board is an important aid in the thorough mixing of dust and seeds. It extends across the drum at right angles to the straight side of the door. If the drum is of steel, the metal axle should be welded to the drum, if possible. For a wooden barrel, the axle may be of wood.

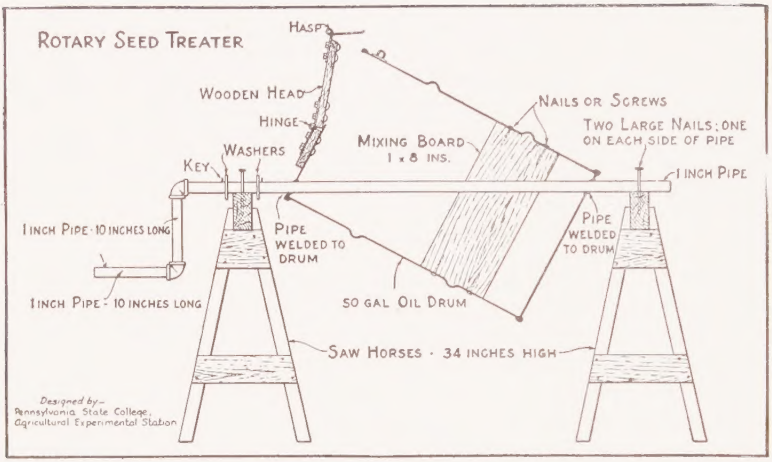

Fig. 1.—Plan for building a seed treater from a metal drum.

2. Box Type.—This kind of seed treater can readily be made, and any tightly constructed box already on hand may be used. If the box is to be constructed from new wood, it should be as near cubical in shape as possible and made with ship-lap boards to prevent loss of dust during the treating process. The proper construction of a box treater is indicated in Fig. 2. All parts, with the exception of the hinges and hasp, are of wood. A box with an inside measurement of 2 x 2 x 1½ feet or 22 x 22 x 22 inches will easily accommodate one bushel of fuzzy seed for each treatment.

Operation of Rotary Treater.

The treater should not be filled more than one-half full of seed, for more than this quantity will give an inadequate distribution of the chemical dust on the surface of the seeds. The dust is most effectively applied when the treater is one-third full. A 30-gallon oil drum or a box with a capacity of about 6 cubic feet will easily handle one bushel of cotton seed.

To the seed in the treater add the correct amount of chemical dust as previously specified in this circular. Too much will be wasteful or may result in injury to the seeds, while too little may not give effective disease control. The treater with its contents of seeds and dust should be slowly revolved for at least 25 times. Placing the treater outdoors will help to protect the operator from any escaping dust, especially when the operator works with his back to the wind so that all dust will blow away from him. Precautions for hand-

ling the dust are stated on each container, and they should be followed carefully.

REGINNED OR DELINTED SEED.

Gins have been required to regin seed of the 1942 crop because the linters removed in reginning are used for war materials. The following suggestions are offered for those farmers who may be planting reginned seed in 1943.

A moderate amount of reginning (removing 100 to 150 pounds of linters per ton of seed) improves seed for planting purposes. Such seed plant more evenly and can be treated

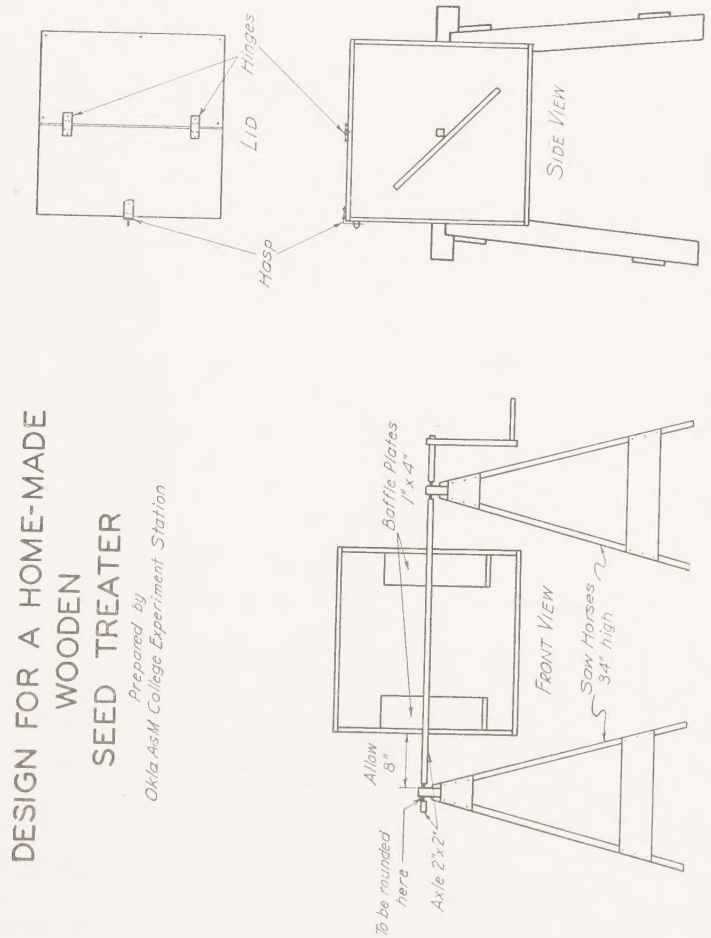

Fig. 2.—Plan for building a wooden rotary seed treater.

more easily than fuzzy seed, and less chemical is required. They germinate more quickly than fuzzy seed. A moderate degree of reginning is recommended as a good practice to improve planting seed. However, if seed has been heavily reginned (removing more than 175 pounds of linters per ton of seed) the seed coats will usually be so badly cut that the seed are definitely inferior for planting, and under these conditions chemical treatment may do more harm than good.

Sulphuric acid treatment of planting seed removes all the linters and produces a very high quality grade of smooth planting seed. During the war, however, it is impossible to secure acid for this purpose. Furthermore the acid treatment destroys the valuable linters.

PRECAUTIONS

Mercury dusts are poisonous when taken into the body either through the mouth and stomach or breathed in through the lungs. The precautions printed upon the container should be followed carefully. *Treated seed should not be fed to farm animals,* and the chemical should be kept tightly covered, in a safe place. Seed had best be treated outdoors or at least in a well ventilated place. Care should be taken to avoid breathing any more dust than is necessary; it is advisable to wear a dry-filter mask, especially if a large quantity of seed is being treated. Operators of commercial treating machines should always wear approved dust masks and install dust-catching devices.

When moistened, these dusts, especially the New Improved Ceresan, may be irritating or blistering to the skin. Therefore, avoid accumulations of dust on the skin, especially if perspiring. Thoroughly wash hands and face and exposed parts of the body with soap and water. Keep dusts away from the eyes. Operators of commercial treaters should wear non-porous gloves and aprons. Some persons are much more susceptible to skin injury than others.

Teated Seed Should Not Be Fed Nor Disposed of to Oil Mills.

Containers Holding Treated Seed Should Be Labeled "POISON."

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